

REMARKS

Favorable reconsideration is respectfully requested in view of the foregoing amendments and following remarks.

Independent claims 5 and 18 have been amended so as to recite that the method of the invention for forming a copper interconnection on a semiconductor device uses an electroless copper plating liquid excluding alkaline metals and endocrine disruptors. These amendments are supported in the specification at page 6, lines 2-8 and page 7, lines 1-3. See also page 3, line 12 to page 6, line 10 of the specification. Claims 22, 25 and 31 are cancelled without prejudice and added back as new claims 33-35, respectively.

Turning to the Official Action, claims 5-6, 8, 18 and 20-26 are rejected under 35 USC 102 as anticipated by USP 6,258,233.

Claims 7, 19 and 27-32 are further rejected under 35 USC 103 as being unpatentable over USP 6,258,233 in view of USP 4,563,217.

These grounds of rejection are respectfully traversed as applied to the claims after the foregoing amendments.

As described in the specification of the instant application on page 3, lines 16-22, if a semiconductor substrate is contaminated by alkaline metals such as Na and K, then semiconductor characteristics are degraded. From this point of view, a plating method as recited in claims 5 and 18 uses an electroless copper plating liquid excluding alkaline metals, for example, an electroless copper plating liquid containing EDTA•4H (ethylenediaminetetraacetic acid).

In this regard, Cheung et al. employ an electroless copper plating liquid containing EDTA. However, Cheung et al. does not explicitly address the use of EDTA•4H or other electroless copper plating liquids excluding alkaline metals (see column 4, lines 23-37). Cheung et al. teach the use of alkaline metals at column 4, line 32. Kikuchi et al. also employ an electroless copper plating liquid containing EDTA•2Na as a complexing agent (see column 2, lines 6-9). Kikuchi et al. teach the use of many alkaline metals at column 1, line 67 to column 2,

line 21. Thus, none of the references relied upon by the Examiner disclose or suggest the use of an electroless copper plating liquid excluding alkaline metals.

Further, the electroless copper plating liquid as recited in claims 5 and 18 excludes endocrine disruptors. Particularly, as recited in claims 33 and 34, the electroless copper plating liquid contains an aldehyde acid such as a glyoxylic acid, which is not an endocrine disruptor.

On the other hand, Cheung et al. employ an electroless copper plating liquid containing formaldehyde (HCHO), which is an endocrine disruptor (see column 4, lines 34-35). Kikuchi et al. also teach the use of formaldehyde in their plating liquids. See Examples 8-12 in columns 15-17. Kikuchi et al. does not teach or suggest the use of a glyoxylic acid. Thus, none of the references relied upon by the Examiner disclose or suggest the use of an electroless copper plating liquid excluding endocrine disruptors.

As described above, none of the references teach or suggest the use of an electroless copper plating liquid excluding alkali metals and endocrine disruptors. Accordingly, it is submitted that claims 5 and 18, as amended, patentably define over any proper combination of Cheung et al. and Kikuchi et al.

Accordingly, reconsideration and allowance is respectfully solicited.

Respectfully submitted,

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